Amendments to the Claims:

The following listing of claims will replace any/all prior versions, and listings, of claims in the application, wherein additions are shown in underlined text and deletions are shown in strike-out text or between brackets ([ ]):

1. **(Original)** A catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus, the catalytic composite comprising:

a) a support structure, made of a non zeolite inorganic oxide, having a void fraction ranging from 0.30 to 0.95 and a surface area of from 40 m^2/g to 500 m^2/g, the support structure having a shape selected from a ring, a hollow cylinder, a cross or multi partition ring or cylinder with 2, 3, or 4 cell partitions, a saddle, a solid ring, a solid cylinder, a sphere, and a honeycomb body; and

b) from 0.01 to 10% by weight of a catalytically active species comprising a group VIII metal, based on the weight of the catalytic composite, which is deposited on the support structure.

2. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 1, wherein ~~the void fraction is from 0.30 to 0.95~~ and the surface area is from 50 m^2/g to 500 m^2/g.

3. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 1 ~~or 2~~, wherein the inorganic oxide is selected from the group consisting of alumina, silica, titania, zirconia and mixtures thereof.

4. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 1 ~~or 2~~, wherein the inorganic oxide is γ-alumina.

5. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 1 ~~or 2~~, wherein the inorganic oxide is α-alumina.

6. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 5~~, wherein the support structure is in the shape of a Raschig ring.

7. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 6~~, wherein the group VIII metal is nickel.

8. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 7~~, wherein the group VIII metal is in the form of a metal salt or a metal complex.

9. **(Original)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 8, wherein the metal salt is in an ionic state.

10. **(Original)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 8, wherein the metal salt is a metal sulphate, a metal phosphate, a metal oxalate or a metal acetate.

11. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 6~~, wherein the catalytically active species is nickel sulphate.

12. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 6~~, wherein the catalytically active species is nickel chloride.

13. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 9 ~~to 12~~, wherein the catalytically active species is in admixture with ammonium sulphate or ammonium phosphate.

14. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 6~~, wherein the catalytically active species further comprises ~~a group VIII metal and~~ a ligand, wherein the ligand comprises one or more atoms selected from the group consisting of carbon, hydrogen, oxygen, nitrogen and phosphorus.

15. **(Original)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to claim 14, wherein the group VIII metal is in the zero oxidation state.

16. **(Currently Amended)** The catalytic composite for use as a random packing material and catalyst in a catalytic distillation apparatus according to ~~any one of claims~~ claim 1 ~~to 6~~, wherein the group VIII metal is palladium, platinum or rhodium.

17. **(Currently Amended)** A process for the selective dimerization of a lower alkene to a C_6-C_{12} alkene, which process comprises contacting the lower alkene with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 1 ~~to 16~~, under catalytic distillation conditions.

18. **(Original)** The process according to claim 17, wherein the lower alkene is selected from 1-butene, 2-butene and isobutene, and the C_6-C_{12} alkene is selected from trimethylpentene, n-octene, dimethylhexene and methylheptene.

19. **(Currently Amended)** The process according to claim 17 ~~or 18~~, wherein the catalytic composite is admixed with inert distillation packing.

20. **(Original)** The process according to claim 19, wherein the ratio of the catalytic composite to inert distillation packing is from 10:1 to 1:10.

21. **(Original)** The process according to claim 19, wherein the catalytic composite and inert distillation packing are used in separate zones of the catalytic distillation column.

22. **(Original)** The process according to claim 17, wherein the lower alkene is a C_4 alkene and the C_6 to C_{12} alkene is predominantly a C_8 alkene.

23. **(Original)** The process according to claim 22, wherein the C_8 alkene is a trimethylpentene.

24. **(Currently Amended)** A process for the hydrogenation of an alkene to an alkane, which process comprises contacting the alkene with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 14 ~~to 16~~, and hydrogen, under catalytic distillation conditions.

25. **(Original)** The process according to claim 24 wherein the alkene is selected from trimethylpentene, n-octene, dimethylhexene and methylheptene.

26. **(Currently Amended)** The process according to claim 24 ~~or 25~~, wherein the catalytic composite is admixed with inert distillation packing.

27. **(Original)** The process according to claim 26, wherein the ratio of the catalytic composite to inert distillation packing is from 10:1 to 1:10.

28. **(Original)** The process according to claim 26 wherein the catalytic composite and inert distillation packing are used in separate zones of the catalytic distillation column.

29. **(Currently Amended)** The process according to ~~any one of claims~~ claim 24 ~~to 28~~, wherein the alkene is trimethylpentene and the alkane is trimethylpentane.

30. **(Currently Amended)** A process for preparing high octane compounds, the process comprising:

a) contacting, under catalytic distillation conditions to obtain a C6 to C18 alekene, a C_2 to C_6 alkene with a first catalytic composite ~~as claimed in any one of claims 1 to 16, under catalytic distillation conditions, to obtain a C_6 to C_{18} alkene~~, the first catalytic composite comprising

(i) a support structure, made of a non zeolite inorganic oxide, having a void fraction ranging from 0.30 to 0.95 and a surface area of from 40 m^2/g to 500 m^2/g, the support structure having a shape selected from a ring, a hollow cylinder, a cross or multi partition ring or cylinder with 2, 3, or 4 cell partitions, a saddle, a solid ring, a solid cylinder, a sphere, and a honeycomb body, and

(ii) from 0.01 to 10% by weight of a catalytically active species comprising a group VIII metal, based on the weight of the catalytic composite, which is deposited on the support structure; and

b) contacting under catalytic distillation conditions to obtain a C_6 to C_{18} alkane the C_6 to C_{18} alkene from step a) with a second catalytic composite ~~as claimed in any one of claims 14 to 16, and hydrogen, under catalytic distillation conditions, to obtain a C_6 to C_{18} alkane~~, the second catalytic composite comprising

(i) a support structure, made of a non zeolite inorganic oxide, having a void fraction ranging from 0.30 to 0.95 and a surface area of from 40 m^2/g to 500 m^2/g, the support structure having a shape selected from a ring, a hollow cylinder, a cross or multi partition ring or cylinder with 2, 3, or 4 cell partitions, a saddle, a solid ring, a solid cylinder, a sphere, and a honeycomb body, and

(ii) from 0.01 to 10% by weight of a catalytically active species comprising a group VIII metal, based on the weight of the catalytic composite, which is deposited on the support structure, and a ligand comprises one or more atoms selected from the group consisting of carbon, hydrogen, oxygen, nitrogen and phosphorus.

31. **(Original)** The process according to claim 30, wherein the process steps a) and b) are carried out in a single catalytic distillation column.

32. **(Original)** The process according to claim 30, wherein the process steps a) and b) are carried out in separate catalytic distillation columns.

33. **(Currently Amended)** The process according to claim 30 or 31, wherein the C_2 to C_6 alkene is a C_4 alkene and the C_6 to C_{18} alkene is a C_8 alkene.

34. **(Original)** The process according to claim 33, wherein the C_8 alkene is trimethylpentene.

35. **(Currently Amended)** A process for preparing high octane compounds, the process comprising:

a) contacting isobutene with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 1 ~~to 16~~, under catalytic distillation conditions, to obtain trimethylpentene; and

b) contacting trimethylpentene with a hydrogenation catalyst, and hydrogen, under batch reaction conditions or under hydrogenation reaction conditions to obtain trimethylpentane.

36. **(Currently Amended)** A process for the production of C_6-C_{18} alkenes, which process comprises contacting a mixture of C_2-C_6 alkenes with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 1 ~~to 16~~, under catalytic distillation conditions.

37. **(Original)** A process according to claim 36, wherein each C_2-C_6 alkene in the mixture is oligomerized within different reactive zones found in a single catalytic distillation column.

38. **(Original)** A process according to claim 36, wherein each C_2-C_6 alkene is oligomerized within different reactive zones found in two or more linked catalytic distillation column.

39. **(Currently Amended)** A process according to ~~any one of claims~~ claim 36 ~~to~~ 38, wherein the mixture of C_2-C_6 alkenes comprises one or more C_4 alkenes.

40. **(Currently Amended)** A process for the selective oligomerization of a lower alkene to a C_6-C_{18} alkene, which process comprises contacting a mixture of C_2 to C_6 alkenes and C_1 to C_6 alkanes with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 1 ~~to 16~~, under catalytic distillation conditions.

41. **(Original)** A catalytic composite for use as a random packing hydrogenation catalyst in a catalytic distillation apparatus, the catalytic composite comprising:

a) a support structure, made of an inorganic oxide and having a void fraction ranging from 0.30 to 0.95, the support structure having a shape selected from a ring, a hollow cylinder, a cross or multi partition ring or cylinder with 2, 3, or 4 cell partitions, a saddle, a solid ring, a solid cylinder, a sphere, and a honeycomb body; and

b) from 0.01 to 10% by weight of palladium, platinum or rhodium, based on the weight of the catalytic composite, which is deposited on the support structure

42. **(Original)** The catalytic composite for use as a random packing hydrogenation catalyst in a catalytic distillation apparatus according to claim 41, wherein the inorganic oxide is α-alumina.

43. **(Original)** The catalytic composite for use as a random packing hydrogenation catalyst in a catalytic distillation apparatus according to claim 42, wherein the α-alumina has a surface area of from 0.1 to 1.0 m^2/g.

44. **(Currently Amended)** A process for the hydrogenation of butadiene, the process comprising contacting butadiene with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 41 ~~to 43~~, and hydrogen, under catalytic distillation conditions.

45. **(Currently Amended)** A process for the selective hydrogenation of methylacetylene and propadiene in a C3 fraction to provide propylene, the process comprising contacting the C3 fraction with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 41 ~~to 43~~, and hydrogen, under catalytic distillation conditions.

46. **(Currently Amended)** A process for the selective hydrogenation of allene and propyne in a fluid catalytic cracking (FCC) stream, the process comprising contacting the FCC stream with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 41 ~~to 43~~, and hydrogen, under catalytic distillation conditions.

47. **(Currently Amended)** A process for the selective hydrogenation of butadiene in a raffinate I or a raffinate II stream to provide a butene, the process comprising contacting the raffinate I or the raffinate II stream with ~~a~~ the catalytic composite ~~as claimed in any one of claims~~ of claim 41 ~~to 43~~, and hydrogen, under catalytic distillation conditions.